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| **Nicholas Vadivelu** | | [nicholasvadivelu.com](https://nicholasvadivelu.com/) [github.com/n2cholas](https://github.com/n2cholas) [nicholas.vadivelu@gmail.com](https://uofwaterloo-my.sharepoint.com/Users/nicv/Downloads/nicholas.vadivelu@gmail.com) |
| Experience | **NVIDIA** · Performance Software Engineering Intern *Aug 2020 – Present*   * Optimizing sparse BERT inference performance for **TensorRT** in **C++**, enabling a potential **50% reduction** in inference time, memory usage, and power usage for customers   **Google Brain** · Software Engineering Intern *May 2019 – Aug 2019*   * Unlocked K-FAC for **over 370,000 users** by implementing and open sourcing automatic support for arbitrary neural network architectures and integrating it into the Keras ecosystem * Enabled simple **multi-node, multi-GPU/TPU training** for users by incorporating **TensorFlow's** Distribution Strategy and efficient distributed operation placement * Designed, created, and open-sourced idiomatic, reproducible training recipes for users, carefully considering hyperparameter ranges, baselines, datasets, and models   **Uber ATG** · Research Intern *Jan 2020 – Aug 2020*   * Improved **object detection by** **90%** (AP) and **motion forecasting by** **22%** (L2) of a self-driving neural net under realistic positional error, significantly improving safety for future riders * Wrote a **first author paper** on the learned positional error correction system (under review)   **John Hancock Financial** · Data Science Intern *May 2018 – Aug 2018*   * Achieved a **fraud detection rate of** **63%** through designing an unsupervised ML model * Deployed 25 fraud identifying rules in **SQL**, which **evaluated 20,000+** and **flagged 100+ claims**   **Sunnybrook Research Institute** · Software Developer Intern *Jul 2017 – Aug 2017*   * Improved MRI segmentation accuracy by **up to 80%** and reduced time to contour MRI scans from ~**5 hrs to ~40 mins** by implementing techniques like watershed, clustering, and more | |
| Open Source | **PyTorch Ignite:** Improved performance by **up to 63%** by designing and implementing **async updates for distributed metrics** with tests and documentation | |
| Projects | **Thrive Life Simulator:** Wrote a **3D ray-casting game engine** from scratch for a dinosaur world simulation game in **Java** with **object-oriented design** and detailed documentation­  **PixelShot 300:** Built a one-pixel camera from scratch capable of capturing a 300x300 photo using techniques such as **proto-threading** in **Arduino** and **Java**  **Vim Clone:** Recreated the text editor using **object-oriented design** and **C++** best practices, such as implementing the **Model-View-Controller** pattern and extensively using STL functionality | |
| Leadership | **Data Science Club Lectures:** Designed and presented workshops about neural networks in **TensorFlow**,machine learning in **scikit-learn**,and data cleaning in **pandas** for **300+ students**  **WATonomous Design Team:** Implemented real-time object detection in **Tensorflow, OpenCV** | |
| Education | **University of Waterloo** · Computer Science & Statistics (B. Math) *2022*  Cumulative GPA: 3.94/4.00 - Dean's List   * Research (Prof. Lin Tan): Proposed and implemented deep learning methods to identify bugs in code * Research (Prof. Pascal Poupart): Investigated practical second order optimization methods for NNs | |